Homework 6

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March 10, 2017

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Nutritional Requirements - A rancher has determined that the minimum weekly nutritional requirements for an average-sized horse include 40lb of protein, 20 lb of carbohydrates, and 45lb of roughage. These are obtain from the following sources in varying amounts at the prices indicated:

	Protein (lb)	Carbohydrate (lb)	Roughage (lb)	Cost
Hay (per table)	0.5	2.0	5.0	$1.80
Oats (per sack)	1.0	4.0	2.0	3.50
Feeding blocks (per block)	2.0	0.5	1.0	0.40
High-protein concentrate (per sack)	6.0	1.0	2.5	1.00
Requirements per horse (per week)	40.0	20.0	45.0	

Figure 1: image.

Formulate a mathematical model to determine how to meeting the minimum nutritional requirements at minimum cost.

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Solve using graphical analysis

Maximize 10x + 35y subject to

$$2x + 3y \geq 6$$
$$3x - y \leq 15$$
$$-x + y \leq 4$$
$$2x + y \leq 27$$
$$x \geq 0$$
$$y \geq 0$$

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Using the $Methods$ of 7.3 solve problems 6 from section 7.2

Maximize 10x + 35y subject to

$$2x + 3y \geq 6$$
$$3x - y \leq 15$$

$$-x + y \leq 4$$
$$2x + y \leq 27$$
$$x \geq 0$$
$$y \geq 0$$

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Using teh Simplex Method to resolve the problems. Using the Simplex Method to find both the maximum solution and the minimum solution to Problems 8-12. Assume x $\geq$ 0 and y $\geq$ 0 for each problem.

Maximize 10x + 35y subject to

$$2x + 3y \geq 6$$
$$3x - y \leq 15$$
$$-x + y \leq 4$$
$$2x + y \leq 27$$
$$x \geq 0$$
$$y \geq 0$$

Page 284: problem 1

For the example problems in this section, determine the sensitivity of the optimal solution to a change in c_2 using the objective function $25x_1 + c_2x_2$.

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